AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1-22. (cancelled)

23. (currently amended) Process ~~according to claim 22~~ for the balanced charging of a lithium ion or lithium polymer battery comprised of a series of n different cells (1), with n > 2, each cell being comprised of elements mounted in parallel, said process comprising the steps of:

continuously providing, from an onset of a charging operation of the battery (2) and throughout the charging operation, a surveillance of levels of charge of the different cells (1);

carrying out, as a function of the surveillance of said charge levels, one of i) a uniform supply of all the cells (1), and ii) a balancing of said charge levels of said cells (1) by supplying said cells in a differentiated manner as a function of said cell's current levels of charge;

triggering for each cell (1) of the battery, one cell after another cell in a sequential manner, for a fractional portion of the total charge time of the battery (2), sequences comprising a refreshed evaluation of the level of the charge of the cell (1) in question, followed, as a function of the cell's level of

charge and with respect to all the levels of charge of the other cells (1) of the battery, a uniform or differentiated supply, according to a repeating cycle throughout the charging operation; and ~~characterized in that it comprises at least the execution of~~

executing, from the beginning of the charging operation, the following operations under the management of a digital processing unit (3)~~, and this from the beginning of charging~~:

- A) evaluation~~, preferably at regular intervals,~~ of the quantity of energy stored in each cell (1) by measuring a parameter indicative of said quantity;

- B) comparative analysis of the different evaluated quantities of energy or of the different values of the measured parameter for each cell (1);

- C) determination of the cell (1) tardiest to charge and~~, as the case may be,~~ of the cell or cells (1) the most advanced in charging; and

- D) supplying the different cells (1) ~~mounted in series~~ in one of i) a uniform manner and ii) ~~or~~ with the limitation of charging current for the cells (1) other than the tardiest or for the cell or cells most advanced in charging, by derivation of all or a portion of said current at ~~the~~ a limited level ~~of this or these latter~~;

- with a sequential repetition of the ~~different mentioned~~ operations A), B), C), and D) obtaining one of i) an end condition of charge of the battery (2) [[or]] and ii) a ~~the~~

detection of a fault, of a dysfunction or an exceeding of an admissible threshold value.

24. (currently amended) Process according to claim 23, ~~characterized in that~~ wherein the measured parameter in each respective cell (1) ~~and~~ utilized for evaluation of the quantity of energy stored in each respective cell ~~this latter,~~ is the voltage at the terminals of the respective cell (1) ~~in question~~.

25. (currently amended) Process according to claim 23, ~~characterized in that the~~ wherein derivation of current in the cell or cells ~~that are~~ most advanced in charging [[,]] is carried out by ~~a means of~~ derivation circuits (4) each associated by mounting in parallel with one of said cells (1), said circuits (4) each integrating a switching member (5) and~~, as the case may be,~~ at least one component for dissipation of energy (6)~~, if desired adjustable, such as for example an electrical resistance~~.

26. (currently amended) Process according to claim 24, ~~characterized in that~~ wherein charging with sequential balancing ~~consists more precisely in carrying out, while repeating them during the course of charging the battery (2),~~ comprises the following further operations:

a) scrutinizing one by one all the cells (1) of the battery (2) by measuring the voltages at ~~their~~ the cell

terminals, ~~this~~ the voltage measurement being without the resistances (6) of derivation or balancing being connected;

b) detecting the cell (1) tardiest to charge;

c) detecting the cells (1) which, relative to the least charged or tardiest cell (1), have an overcharge greater than a predetermined threshold value of difference of capacity~~, for example corresponding to a difference of voltage (dVs) of 10 mV~~;

d) individually connecting each cell (1) detected to have a surcharge greater than a threshold value, to a corresponding balancing component for dissipation of energy ~~resistance (6)~~ so as to produce a decrease of the charging current for each of the cells (1) in question~~, for example of about 10%,~~ during a predetermined sequential duration~~, for example two seconds~~;

e) disconnecting the balancing components for dissipation of energy ~~resistances (6)~~ of all the cells (1) after lapse of the predetermined sequential duration; and

f) carrying out again steps a) to e) after the elapse of a stabilization delay of the voltages of the cells (1).

27. (currently amended) Process according to claim [[22]] 23, ~~characterized in that~~ wherein the charging of the battery (2) is normally stopped when the current intensity of the overall charge of the assembly of cells (1) ~~of this latter~~ descends below a predetermined threshold value~~, for example 50 mA~~.

28. (currently amended) Process according to claim 25, ~~characterized in that~~ wherein the voltage at the terminals of each cell (1) is measured ~~precisely~~ by an assembly (7) of corresponding measurement modules (7'), whose output signals are transmitted~~, preferably after digitization,~~ to the digital processing unit (3), ~~this latter~~ the digital processing unit controlling, in the following cycle, the switching members (5) of the different derivation circuits (4) as a function of the comparative development of said output signals provided by the modules (7').

29. (currently amended) Process according to claim 23, ~~characterized in that~~ wherein,

the operations are repeated, during all the charging operation, as a cyclic loop formed by two operational half cycles, carried out successively at each cycle loop, i) a first half cycle comprising the consecutive execution of ~~the following operations:~~ successive reading of the voltages of the different cells (1) and triggering, offset in time, the balancing resistance (6) for each cell (1) whose voltage difference (dV) with the tardiest cell of the preceding cycle is greater than a threshold value (dVs), and ii) ~~the~~ a second half cycle comprising the following operations: successive disconnection of the balancing resistances (6) of the different cells (1) and waiting

for the stabilization of the voltages of the different cells (1) before their reading during the first half cycle of the following cycle, the two half cycles ~~preferably having substantially similar durations, for example about 2 seconds~~.

30. (currently amended) Process according to claim 29, ~~characterized in that~~ wherein the threshold value of voltage difference (dVs) ~~consists~~ comprises in a first predetermined fixed value (V1)~~, for example 10 mV, if~~ when the voltage difference (dV) between the voltage of the cell (1) having the highest voltage and the voltage of the cell (1) having the least voltage is less than a second predetermined fixed value (V2), greater than the first predetermined threshold value (V1)~~, for example 100 mV~~.

31. (currently amended) Process according to claim 30, ~~characterized in that~~ wherein, ~~if~~ when the voltage difference (dV) between the voltage of the cell (1) having the highest voltage and the voltage of the cell (1) having the lowest voltage is greater than a second predetermined fixed value (V2)~~, for example 100 mV,~~ the threshold value of voltage difference (dVs) consists of a third predetermined fixed value (V3) less than said second value (V2)~~, for example 30 mV~~.

32. (currently amended) Process according to claim 31, ~~characterized in that~~ wherein the third predetermined fixed value (V3) is greater than said first predetermined fixed value (V1).

33. (currently amended) Process according to claim 29, ~~characterized in that~~ wherein the threshold value of the difference of voltage (dVs) corresponds to a given fraction of the voltage difference (dV), measured during the preceding cycle between the voltage of the cell (1) having the highest voltage and the voltage of the cell (1) having the lowest voltage, ~~if~~ when during the cycle taking place, said voltage difference (dV) is still higher than a fourth predetermined fixed value (V4)~~, for example 10 mV~~.

34. (currently amended) Process according to claim 29, ~~characterized in that~~ wherein the measurements of the voltages of the different cells (1) are carried out only after the elapse of a give delay~~, for example 2 seconds,~~ following the suppression of the current derivations, so as to permit stabilization of the voltages at the terminals of said cells (1).

35. (currently amended) Process according to claim 26, ~~characterized in that~~ wherein the powers of the different derivation circuits (4) are selected to be near the values provided by the formula:

$$\text{Psd max} = \frac{\text{V max cell} * \% * \text{AH}}{\text{Tc}}$$

in which:

Psd max = maximum power optimized to dissipate, expressed in watts;

Vmax cell = maximum voltage measured during charging at the terminals of a cell, expressed in volts;

% = ratio expressed in percentage, corresponding to the maximum difference between two cells to compensate during charging;

AH = nominal capacitance of the battery expressed in Ah (Ampere-hours);

Tc = battery charge time expressed in hours.

36. (currently amended) Process according to claim 23, ~~characterized in that it consists~~ further comprising, at the outset of the charging operation, before triggering the execution of the operations A), B), C), and D), in measuring the standby voltage (Vo) of a charger (8) connected to the battery (2) ~~as to its charge~~, and stopping said charging operation upon a ~~process with if desired the~~ triggering of a corresponding arm or ~~and/or~~ display of a message, [[if]] when said standby voltage (Vo) is greater than ~~[n x~~ n times (n*x) a maximum admissible voltage (Vmax) for each cell (1) ~~(1)]~~.

37. (currently amended) Process according to claim 29, ~~characterized in that it consists~~ further comprising, before the execution of a following loop, ~~in~~ a step of verifying whether at least one of the cells (1) of the battery (2) has at ~~its~~ the cell's terminals a voltage higher than the maximum admissible voltage (Vmax) and~~, in the affirmative,~~ thereupon in interrupting the charging operation ~~process of charging, if desired with the triggering of a corresponding alarm and/or display of a message~~.

38-40. (cancelled).

41. (new) Process according to claim 25, the component for dissipation of energy is a resistance.

42. (new) Process according to claim 25, the component for dissipation of energy is an adjustable resistance.

43. (new) Process according to claim 26, the component for dissipation of energy is a resistance.